

A² Then, there is considered a cross sectional shape 10208 which is obtained when the above-mentioned island-like structure is cut off by a surface 10202 parallel with a surface 10203 of the poly-Si film. The main structure of the present invention is that the cross sectional shape is the polygon having n ($n > 20$) vertexes and also is the polygon having m ($m > 8$) vertexes, in which the interior angle is equal to or larger than 180° , of these vertexes. In embodiment 1, the cross sectional shape having the island-like shape is made the shape as shown in Fig. 2B by making reference to the Koch curve. The Koch curve is the famous graphic form in the fractal geometry.

IN THE CLAIMS:

Please cancel claim 8 and amend claims 1, 6 and 9 as follows:

- A³ 1. A method of manufacturing a semiconductor device, comprising:
- the process of forming a semiconductor thin film having the amorphous structure containing silicon as the main component;
 - the step of adding metal to said semiconductor thin film having the amorphous structure;
 - the process of reforming said semiconductor thin film having the amorphous structure into a crystalline semiconductor thin film containing silicon as the main component by a first heat treatment;
 - the process of forming an island-like insulating film;
 - the process of adding a nonmetal element or ion of the nonmetal element to said crystalline semiconductor thin film with said island-like insulating film as a mask to form a region in which the nonmetal element or the ions of the nonmetal element has(have) been added to said crystalline semiconductor thin film; and
 - the process of subjecting said crystalline semiconductor thin film to a second heat treatment to getter said metal to the region to which said nonmetal element or the ions of said nonmetal element has(have) been added,

x3 wherein the shape of said island-like insulating film for the surface parallel with the surface of said crystalline semiconductor thin film is a polygon having n ($n > 20$) vertexes, and also is a polygon having m ($m > 8$) vertexes, in each of which the interior angle is equal to or higher than 180° .

6. (Amended) A method of manufacturing a semiconductor device, comprising:

forming a semiconductor thin film having an amorphous structure and comprising silicon;

adding metal to said semiconductor thin film having the amorphous structure;

A4 reforming said semiconductor thin film having the amorphous structure into a crystalline semiconductor thin film and comprising silicon by a first heat treatment;

forming a mask over said crystalline semiconductor thin film;

adding argon or argon ions to a region of said crystalline semiconductor thin film in accordance with said mask; and

subjecting said crystalline semiconductor thin film to a second heat treatment to getter said metal to the region to which the argon or the argon ions has (have) been added.

x5 9. (Amended) A method of manufacturing a semiconductor device according to claim 6, wherein said argon or the argon ions is added to said crystalline semiconductor thin film at the acceleration voltage of 90 keV with a dose of 2×10^{15} /cm².

Please add new claims 10-16.

--10. A method of manufacturing a semiconductor device according to claim 6, wherein said mask is an insulating film.

11. A method of manufacturing a semiconductor device, comprising:

forming a semiconductor film comprising amorphous silicon;
adding metal to said semiconductor film comprising amorphous silicon;
crystallizing said semiconductor film comprising amorphous silicon by a first heat treatment;
forming a mask over the crystallized semiconductor film;
adding a nonmetal element or ions of the nonmetal element to a region of the crystallized semiconductor film in accordance with said mask; and
subjecting the crystallized semiconductor film to a second heat treatment to getter said metal to the region to which said nonmetal element or the ions of said nonmetal element has (have) been added,
wherein a shape of said mask for the surface parallel with the surface of said crystalline semiconductor film is a polygon having n ($n > 20$) vertexes, and also is a polygon having m ($m > 8$) vertexes, in each of which the interior angle is equal to or higher than 180° .

12. A method of manufacturing a semiconductor device according to claim 11, wherein said mask is an insulating film.

13. A method of manufacturing a semiconductor device according to claim 11, wherein said metal is selected from the group consisting of nickel (Ni), cobalt (Co), palladium (Pd), platinum (Pt) and copper (Cu).

14. A method of manufacturing a semiconductor device according to claim 11, wherein said first heat treatment is performed at the temperature equal to or higher than 400°C and equal to or lower than 700°C .

15. A method manufacturing a semiconductor device according to claim 11, wherein said nonmetal element or ions of said nonmetal element is one kind or plural kinds of elements selected from the group consisting of boron (B), silicon (Si), phosphorus (P), arsenic (As), helium (He), neon (Ne), argon (Ar), Krypton (Kr) and xenon (Xe).

16. A method of manufacturing a semiconductor device according to claim 11,
wherein said second heat treatment is performed at the temperature equal to or higher
than 400° C but equal to or lower than 1,000° C.
